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Review article

South Africa's coalfields — A 2014 perspective

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ABSTRACT

For well over a century and a half coal has played a vital role in South Africa's economy and currently bituminous coal is the primary energy source for domestic electricity generation, as well as being the feedstock for the production of a substantial percentage of the country's liquid fuels. It furthermore provides a considerable source of foreign revenue from exports.

Based on geographic considerations, and variations in the sedimentation, origin, formation, distribution and quality of the coals, 19 coalfields are generally recognised in South Africa. This paper provides an updated review of their exploration and exploitation histories, general geology, coal seam nomenclature and coal qualities. Within the various coalfields autocyclic variability is the norm rather than the exception, whereas allocyclic variability is much less so, and allows for the correlation of genetically related sequences. During the mid-Jurassic break up of Gondwana most of the coal-bearing successions were intruded by dolerite. These intrusions are important as they may cause devolatilisation and burning of the coal, create structural disturbances and related seam correlation problems, and difficulties in mining operations.

Whilst many of the coalfields have been extensively explored and exploited, those in the north of the country have until recently received much less attention. Four coalfields occur partly or wholly within the Limpopo Province of South Africa and these may contain as much as 70% of South Africa's remaining coal resources. These coalfields in particular have been the focus of recent exploration due to the presence of large coking and thermal coal resources, as well as for their coal bed methane potential, and these resources need to be unlocked with regards to creating maximum benefit and minimal environmental degradation.

South Africa's coals have also been recently addressed as palaeoclimate archives recording Gondwana's postglacial climate amelioration by major changes in land plant communities, and proving high-resolution palynostratigraphy as a crucial tool to decipher climate change during the Permo-Carboniferous. This aspect of the coals of South Africa is also reviewed.

Contents

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